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# THE UNITED STATES OF AMERICA

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*March 09, 2005*

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**APPLICATION NUMBER: 60/545,750**

**FILING DATE: February 18, 2004**

**RELATED PCT APPLICATION NUMBER: PCT/US05/05010**



Certified by

Under Secretary of Commerce  
for Intellectual Property  
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**PROVISIONAL APPLICATION FOR PATENT COVER SHEET**

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Express Mail Label No. EL993035857US

INVENTOR(S)					
Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)			
John	Oldenburg	Poway, California, U.S.A.			
Additional inventors are being named on the _____ separately numbered sheets attached hereto					
TITLE OF THE INVENTION (500 characters max)					
Method For Producing Golf Shafts Of Like Flex Profiles And Different Weights					
Direct all correspondence to: <b>CORRESPONDENCE ADDRESS</b>					
<input type="checkbox"/> Customer Number: <span style="border: 1px solid black; display: inline-block; width: 250px; height: 30px; vertical-align: middle;"></span>					
<b>OR</b>					
<input checked="" type="checkbox"/> Firm or Individual Name <span style="border-bottom: 1px solid black; display: inline-block; width: 400px;"></span> BIRCH, STEWART, KOLASCH & BIRCH, LLP					
Address <span style="border-bottom: 1px solid black; display: inline-block; width: 400px;"></span> Attn: Thomas M. Small, Esq.					
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City <span style="border-bottom: 1px solid black; display: inline-block; width: 150px;"></span> Los Angeles		State <span style="border-bottom: 1px solid black; display: inline-block; width: 50px;"></span> CA		Zip <span style="border-bottom: 1px solid black; display: inline-block; width: 100px;"></span> 90024-3952	
Country <span style="border-bottom: 1px solid black; display: inline-block; width: 150px;"></span> United States of America		Telephone <span style="border-bottom: 1px solid black; display: inline-block; width: 100px;"></span> 310-209-4400		Fax <span style="border-bottom: 1px solid black; display: inline-block; width: 100px;"></span> 310-209-4450	
ENCLOSED APPLICATION PARTS (check all that apply)					
<input checked="" type="checkbox"/> Specification Number of Pages <span style="border-bottom: 1px solid black; display: inline-block; width: 50px;"></span> 3					
<input type="checkbox"/> Drawing(s) Number of Sheets <span style="border-bottom: 1px solid black; display: inline-block; width: 100px;"></span>					
<input type="checkbox"/> Application Data Sheet. See 37 CFR 1.76					
<input type="checkbox"/> CD(s), Number <span style="border-bottom: 1px solid black; display: inline-block; width: 150px;"></span>					
<input checked="" type="checkbox"/> Other (specify) <span style="border-bottom: 1px solid black; display: inline-block; width: 150px;"></span> 2-Page Memo					
METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT					
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27.					
<input checked="" type="checkbox"/> A check or money order is enclosed to cover the filing fees.					
<input checked="" type="checkbox"/> The Director is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: <span style="border-bottom: 1px solid black; display: inline-block; width: 150px;"></span> 02-2448					
<input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.					
FILING FEE Amount (\$) <span style="border: 1px solid black; display: inline-block; width: 100px; height: 50px; vertical-align: middle; text-align: center; line-height: 50px;">\$160.00</span>					
The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.					
<input checked="" type="checkbox"/> No.					
<input type="checkbox"/> Yes, the name of the U.S. Government agency and the Government contract number are: <span style="border-bottom: 1px solid black; display: inline-block; width: 300px;"></span>					

Respectfully submitted,

[Page 1 of 2]

Date February 17, 2004

SIGNATURE

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REGISTRATION NO. 20,379

(if appropriate)

Docket Number: L0786-01160P

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This collection of information is required by 37 CFR 1.51. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop Provisional Application, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Veronica Kiley

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Veronica Kiley  
(SIGNATURE OF PERSON MAILING PAPER OR FEE)

Inventor: John E. Oldenburg  
Assignee: Aldila, Inc.  
Title: Method For Producing Golf Shafts Of Like  
Flex Profiles And Different Weights  
File No.: L0786-01160P

Enclosed with this "Certificate of Mailing By Express Mail" for filing are:

1. Provisional Application For Patent Cover Sheet;
2. Specification (3 Pages);
3. Memorandum (2 pages);
4. Check in the amount of \$160.00 in payment of Provisional Application filing fee (Large Entity)
5. Return Receipt Postcard

PROVISIONAL APPLICATION UNDER 37 CFR 1.53(b)(2)

Inventor: John E. Oldenburg  
Poway, CA 92064

Title: METHOD FOR PRODUCING GOLF SHAFTS OF LIKE  
FLEX PROFILES AND DIFFERENT WEIGHTS

Background of the Invention:

This present invention relates to the design and manufacture of tubular golf club shafts, and is particularly relevant to the production of tubular composite golf club shafts typically composed of fiber and epoxy, with selected flex stiffness and weight characteristics.

Summary of the Invention

The invention resides in a method for producing golf club shafts of like flex profiles and different weights, so that a family of shafts of varying weights can be produced with the same flex/stiffness of profile. This is accomplished by fixing the amount, location and type of materials that govern bending, namely the outer layers of fiber material with the fibers extending longitudinally of the shaft (referred to as "aligned in the zero degree orientation with respect to the longitudinal axis of the shaft", and varying the amount and type of material that is used to control the torsional properties of the shaft. These are the "core" materials forming the inside diameter of the shaft, typically with fibers positioned at a 45 degree angle with respect to the longitudinal axis. Further weight control is accomplished by trimming incremental sections of the shaft's tip, which has little effect on the bending profile of the shaft.

Other aspects and advantages will be apparent from the accompanying materials.

Description of Materials

Exhibit 1 is a 2-page memorandum entitled METHOD FOR PRODUCING GOLF SHAFTS OF LIKE FLEX PROFILES AND DIFFERENT WEIGHTS explaining the invention and showing a cross-sectional diagram of a golf shaft to illustrate the invention.

### Additional Detailed Description

For further description and clarification:

1. Meaning of "torque core": angle ply (45° fiber) is also known as bias ply and in the cool/hip circle "torque core". It is significant for the reasons that follow in paragraph 2.

2. Explanation of handling of inside diameter ("ID") and outside diameter ("OD"): actually, the ID and OD of the zero plies remain the same which is why the stiffness remains constant throughout the weight range. Simply, if  $E$  (material modulus) and  $I$  (cross sectional moment of inertia) which doesn't vary because the diameters of the zero ply material is fixed the stiffness which equals  $E \cdot I$  remains constant. Now that we are clear with how stiffness is derived, when we remove the angle ply (45° fiber) also known as bias ply and in the cool/hip circle "torque core", to reduce weight, the diameter of the zero plies would be reduced and since  $E$  is proportional to diameter, it would also be reduced and the shaft would become less stiff. To counter this, the entire shaft is moved up the hard mandrel, which defines the ID of the finished shaft, and since the mandrel diameter increases as you move up from the tip, the zero ply material is returned to the same diameters as in the heavier design and the bending stiffness is once again constant. Because 45° material (torque core) is being removed for the lighter weights, the tensional stiffness is reduced.

3. Weight reduction explanation: On the outside of the entire build there is often a small piece of material at the tip that is used for sizing the final diameter. This keeps the full length zero ply material that is crucial for durability, from being disturbed by the grinder during tip sizing. By sliding it up the tool, the ID increases and less material is needed in the tip to bring the diameter up to the final size. Less material = less weight.

4. Tip removal: The drawing is supposed to illustrate the tip of the shaft moving up the mandrel for the different weights. The shaft length remains the same (in this case 46"), as the length is added back at the butt end.

Claims

1. The method substantially as illustrated and described.
2. A family of golf club shafts produced in accordance with the method of claim 1.